ANL
HUS-B **Series No. 8617 – 1 und – 2 (A/B)**

CE

www.catag.com

CATAG AG BASEL

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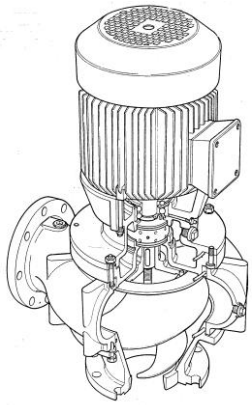
Maintenance Guide

for

HUS - Screwchannelpump

Important: Please read carefully the safety instructions

HUS Screwchannelpumps in monobloc version for all liquids under the pour point



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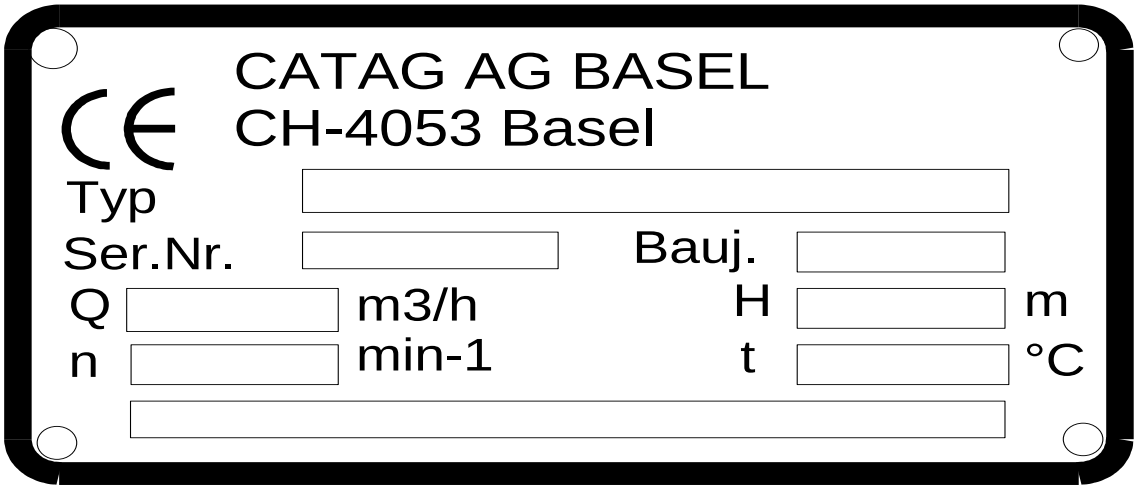
IMPORTANT

N a m e p l a t e



TYP **:** Designation of the model with size.
Ser. Nr. **:** Production number.
Bauj. **:** Month and year of production.
Q **:** Flowrate in m3/h
H **:** Head in m
n **:** Drive speed.
t **:** Max. temperature of the pumped liquid
Leerfeld **:** Materials / ATEX.

If some values could not be obtained by CATAG AG BASEL, we then set acceptable values for duty, head and the max. acceptable temperature.

C O N T E N T S

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Attachments: (depending on agreements, one or several of the following items)

Cutaway of pump
Spare parts list
Performance curve

For a correct performance you may have to read these instructions carefully.
Damages or at least reduced live-time will result, if you do not respect these guides.
Read also the danger notices carefully.

A Arrival of shipment

Upon arrival of shipment check whether order is complete and safe. File any claim i m m e d i a t e l y to the Shipping agent otherwise your rights will be waived.

B Check oil filling

The pump unit is supplied with oil filling and ready for operation.
Check whether the oil is up to the lower edge of the motor chamber fill opening and of the seal chamber (see spares drawing and chapter G2).
Small oil leakage upon arrival is irrelevant, it will disappear after a short period of operation.

C Operating conditions

• Adhere to general regulations and rules for accident prevention and for protection against explosion in sewage installations.
In rooms where there is danger of explosions, only pump units of explosion-proof design must be installed.

• The pumps
- Sewage pumps with screw channel impeller are principally suitable for pumping sewage and sewage sludge up to a temperature of 40°C, which are not corrosive for iron (cast iron design), for automatic intake, i.e. the pumps are either submerged or receive the flow through a suction line. The operating conditions which batch pumps is especially designed for are described separately in the HUS catalogue.

• 15 starts per hour are permitted.
Flow velocity in the pipe line should be at least 0,8 m/sec.

D Erection

Erect pump unit in position, connecting it without distortion, tension and vibration to the pressure line. (suction line)
in case of dry erection make sure that suction line rises towards the pump and that it is mounted absolutely tight.
Respect general rules for arrangement of suction line.
For well sump erection of pump by means of suspension and lifting device, consult the respective directions for installation (enclosed).

E Electric connection

Have the pump unit connected by an expert electrician in accordance with all rules in force.
Compare the line voltage and the type of current with the data on the nameplate.
Connect through a motor starter, preferably with ampere-meter and delayed action fuse.
The adjustment value of Ihe motor starter and the size of the fuse are shown on the characteristics chart.
Admissible voltage fluctuation ±-5%.
See enclosed connection diagram.

F Starting

The pump must only be started after installation. Any work at the pump must only be made after cutting out the electric supply and after standstill of all rotating parts.

Before starting:
1) Flood the pump unit. The pump volute must be completely filled with the pumped fluid and air has to be allowed to escape (by means of air plug at discharge piece or by lifting the non-return valve).

2) Open sluice valves, if any.

3) Check adjustment of float switches (the lowest water level has to be above the top of the pump volute).

At the moment of starting and immediately after starting:
1) Check whether direction of rotation is correct.
• Clockwise, seen from the top
. Starting jerk of pump unit is anti-clockwise,
• Maximum capacity/head (compare by interchanging two phases).
Wrong direction of rotation will result in noisy operation (cornpare by interchanging two phases). To change the direction of rotation, interchange two phases of the line, such as L, against L2 or L3 against L2.

2) Check current consumption and the operation of the pump.
3) In Case of trouble see -K- "trouble shooting".

Instruction for working at the pump:
Any work at the pump must only be made after cutting out electricity supply and after standstill of all rotating parts.
The oil in the sealing chamber and in the motor may be under pressure. Consequently, loosen the drain and fill plug very cautiously and slowly. Remove plugs orify after complete compensation of pressure.

G Maintenance

The pump will work without maintenance throughout a long time.

Controls:
1) Check current consumption from time to time, by means of an ampere-meter.
Constant amps. means normal operation.
Occasional current fluctuations are caused by solids in the pump fluid as they pass the pump.
2) Occasionally, especially if the pump unit is new, or within one week after mounting a new mechanical shaft seal respectively a new shaft sealing, the oil level in the motor casing and seal chamber should be checked.
It must reach the lower edge of the fill opening.
For the types: B an BH, the oil level can be seen at the inspection glass at the motor casing.
An inclined position may show insufficient oil level.

Replenish oil after a small leakage. If the leakage is considerable it is necessary to check the mechanical shaft seals (see H 7). Be sure not to forget the washers for the plugs.
3) In case of normal operation a thorough control should be made at least once a year. If the water is very muddy or sandy, repeat this check at shorter intervals.
a) Oil control for presence of mud and water (see G 2).

Methods:
- by maintenance kit (see instructions in the kit).
- without maintenance kit: Drain oil from motor casing and seal chamber into separate transparent vessels and check whether it contains any impurities or water.

If the oil contains a considerable amount of water, check the mechanical shaft seal. Replace oil. For oil quantity and quality see spares list.

b) **Mechanical shaft seals**

The contact surfaces of the seal have to be shining and without cracks, the O-rings and their seats have to be perfect and clean. Otherwise replace the mechanicat shaft seal.

c) The condition of the contact surfaces of the compound mechanical shaft seals can be checked in the works only. However, in order to evaluate possibility of further use of the shaft seal while the shaft seal is still installed, the following has to be done:
- Remove the motor with the impeller from the pump casing.
- Remove the impeller.
- Thereafter proceed according to sheet: 'Instructions for assembly of shaft sealing, series H, chapter "Pressure testing of shaft sealing".

d) **Pump parts** - Impeller, pump casing, suction parts, neck ring, mobile ring and cooling flange of motor are to be checked for possible wear. Replace defective parts.

An increased gap by wear will reduce the capacity of the pump.
- in case of pumps with channel impeller between impeller resp. mobile ring and neck ring,
- in case of pumps with screw channel impeller between impeller and suction piece.
In case of a 2 mm gap on one side for pumps without channel impeller a replacement is necessary.
In case of pumps **with** screw channel impeller the play between impeller and suction piece can be reduced by omitting spacer shims.

e) Ball bearings have permanent lubrication and do not require any maintenance.
In case of noisy or heavy operation of shaft (try to turn by hand) it is required to overhaul the motor

H Assembly Instructions

Disconnect current before any disassernbly.

1) Drain oil from seal chamber before removing the following parts:
impeller, lower mechanical shaft seal and for smaller pumps the pump casing.

2) Drain oil from the motor casing
and the oil chamber before removing:
cooling flange or sealing flange, upper mechanical shaft seal or shaft sealing, seal casing, ball bearing and motor casing.

1) When dismantling pump or motor parts protect the centering surfaces (tits), contact surfaces, sealing; surfaces and the seals against damage. Even little scratches or blows may cause disalignment and leakage.

2) Stuck impellers can be removed by an impeller extractor or by 2 levers. Help by alternating light blows of a rubber hammer. Take care not to damage the mechanical shaft seal at the impeller hub.

3) For replacement of neck ring or counter ring remove same by extraction, light blows or turning, according to the tools which are available. Be careful not to damage the fitting surface.

4) Mechanical shaft seals have to be handled with great care and they must be protected against damage. Scratches, tricks or blows at the sealing surfaces will cause leakage.

5) Prior to any **assembly**, clean all parts thoroughly. Motor parts have to be free from moisture, otherwise the winding and ball bearings may get damaged.

   Foreign matter, blows and scratches at centering, fitting and sealing surfaces will cause disalignment and leakage of the parts O-rings have to be replaced by all means. They must be fitted without distortion and it will be of advantage to rub them slightly with soap water.

   Oil filling of motor casing and seal chamber his to be made in vertical or horizontal position of the motor, depending an the position of the filling holes. A filling in inclined position could result in a wrong filling quantity.

   Correct oil quantity is always to lower edge of fill opening. An air cushion must be left above.

   Do not forget the washers of the plugs.

   For oil quality see spares list.

Fault finding

The following list shows possible problems and in the second part are the indications for fault finding.
The figure shows the possible causes and remedies.

Problems	*possible items*
Motor overload	8,9,13
Duty or discharge pressure to low	1,2,4,5,7,9,10,17,19
No discharge pressure	2,3,6,18
Unstable flow or discharge pressure	1,2,4,5,6,9
Noise and vibrations	2,4,5,6,7,8,9,10,13,14,15
The pump is clogged	9,10,13,15
Overheated pump	8,9,10,13,15
To much wear	4,5,10,15
Lekage on seal	11,12,16

Error point		*Solution*
1	Wrong rotation sense	Change 2 phases
2	NPSH to low	Increase NPSH of the installation Set feed source higher Install pump in lower point Increase evaporation point Increase diameter of suction pipe Reduce length and complexity of suction pipe
3.	pump is empty	clean and fill up
4.	Cavitation	Increase suction pressure
5.	Pump primes air	Check suction pipe and all connections
6.	Suction pipe is clogged	Check suction pipe or filter if there is one installed
7.	Discharge pressure too high	If applicable, increase dischard pipe diametre
8.	Flow rate too high	Reduce flow rate: -Reduce impeller size -Reduce pump speed
9.	Viscosity to high	Reduce viscosity by heating the liquid for ex.
10.	Liquid temperature to high	Reduce temperature by cooling
11.	worn or damaged shaft seal	Replace shaft seal
12.	O-Ring not compatible with liquide	Replace O-Ring in a better quality. Check with supplier.
13.	Impeller "frets" with housing	-Reduce temperature -Reduce suction pressure -Adjust clearance between housing and impeller
14.	Tension in suction pipe	Mount all pipes in a way that no efforts result on pump or pipe.
15.	Spring of mech. seal is weak	Follow maintenance guide
16.	Pump speed to low	Increase speed
17.	Suction valve closed	Check valve and open it
18.	Not enough pressure on discharge	Increase pressure Increase impeller size Increase speed

If the problems persist, please contact your distributor or CATAG AG

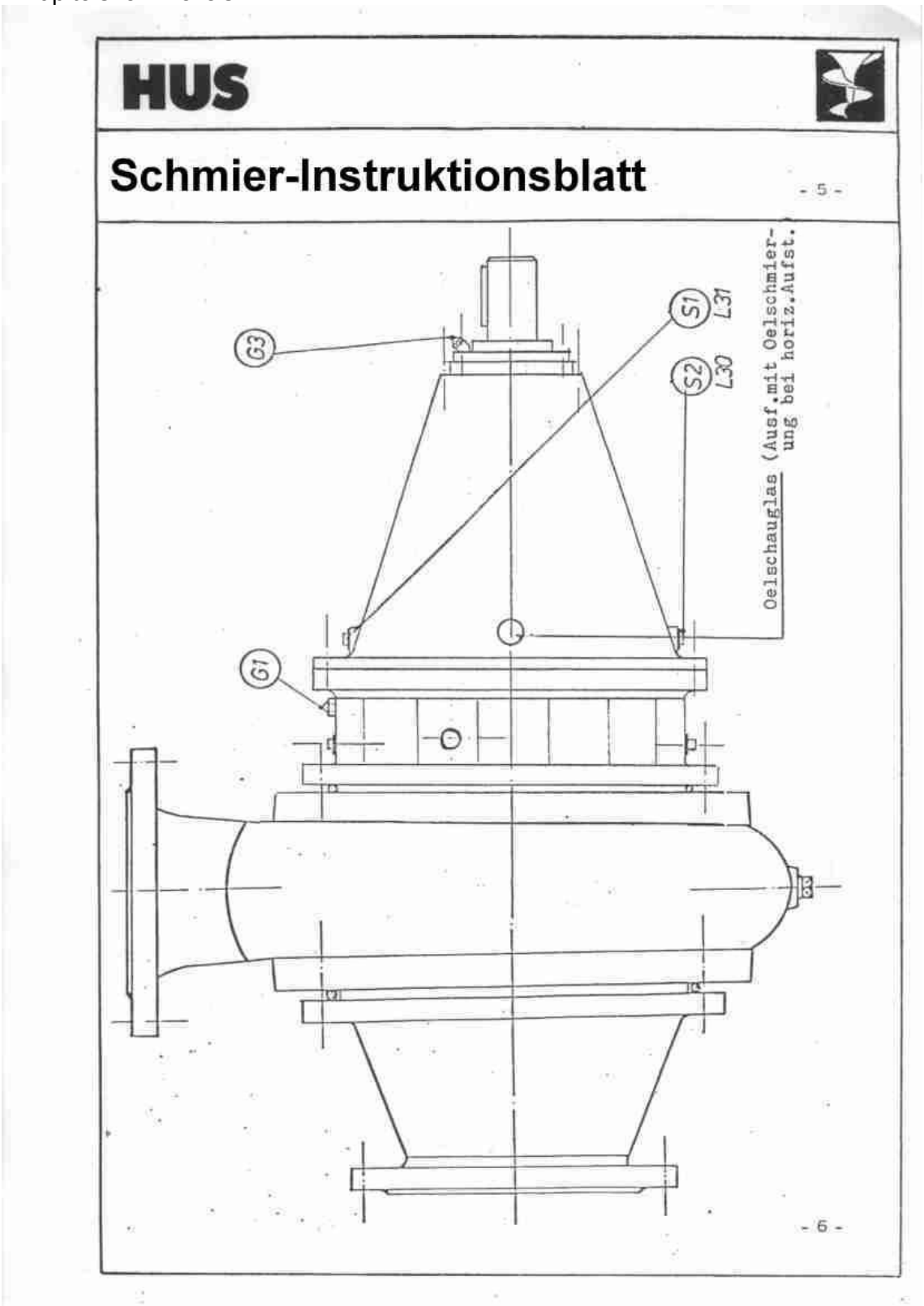
Recommended Spare Parts

We suggest to stock a complete kit of O-rings and a complete set of mech. seals.

In April 2003 CATAG AG BASEL

Lubricating instructions

Fill up to shown levels.



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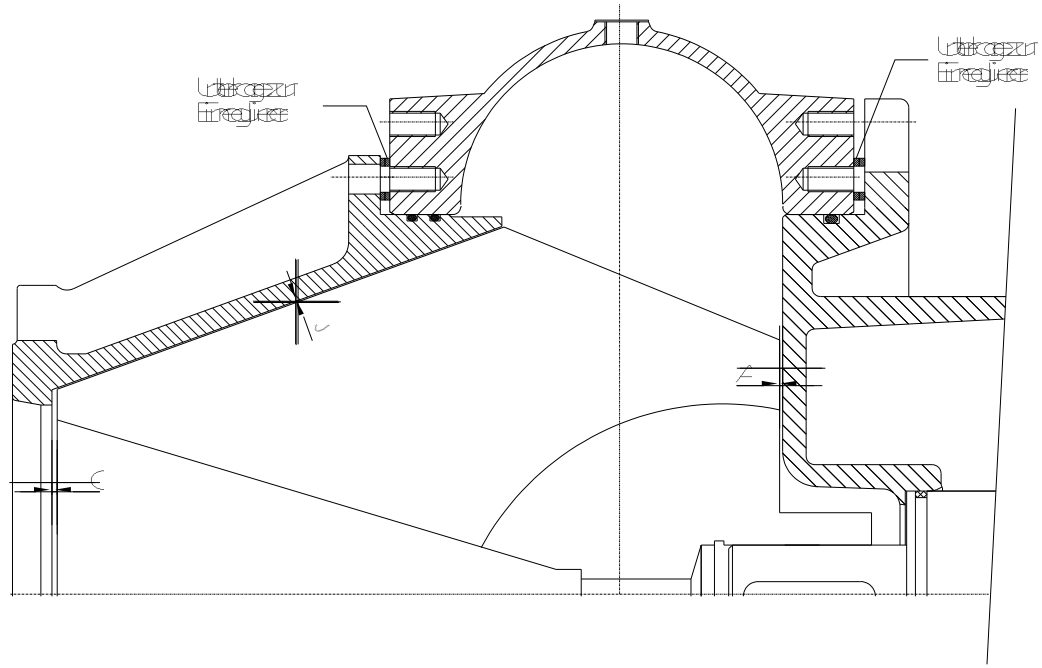
Impeller adjusting. Please add or remove shift-disks to obtain the following clearences.

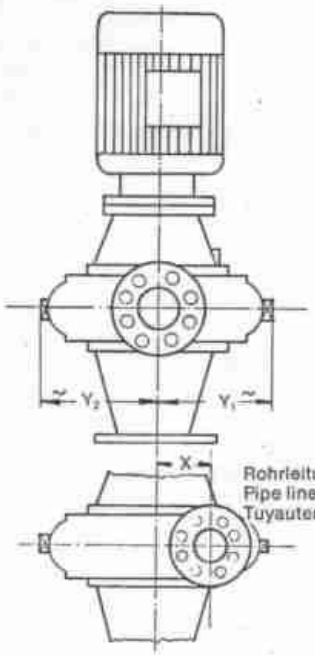


G:\graphik\HUSVATEX\Laufradeinstellungen

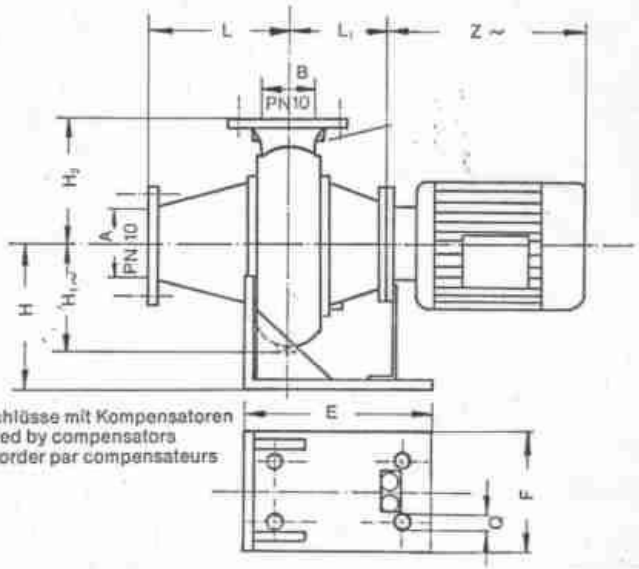
HUS

Abwasserpumpen – nicht überflutbar
Sewage pumps/Pompes pour eaux d' égouts

Ausführung B
Design B
Exécution B



Ausführung BH
Design BH
Exécution BH



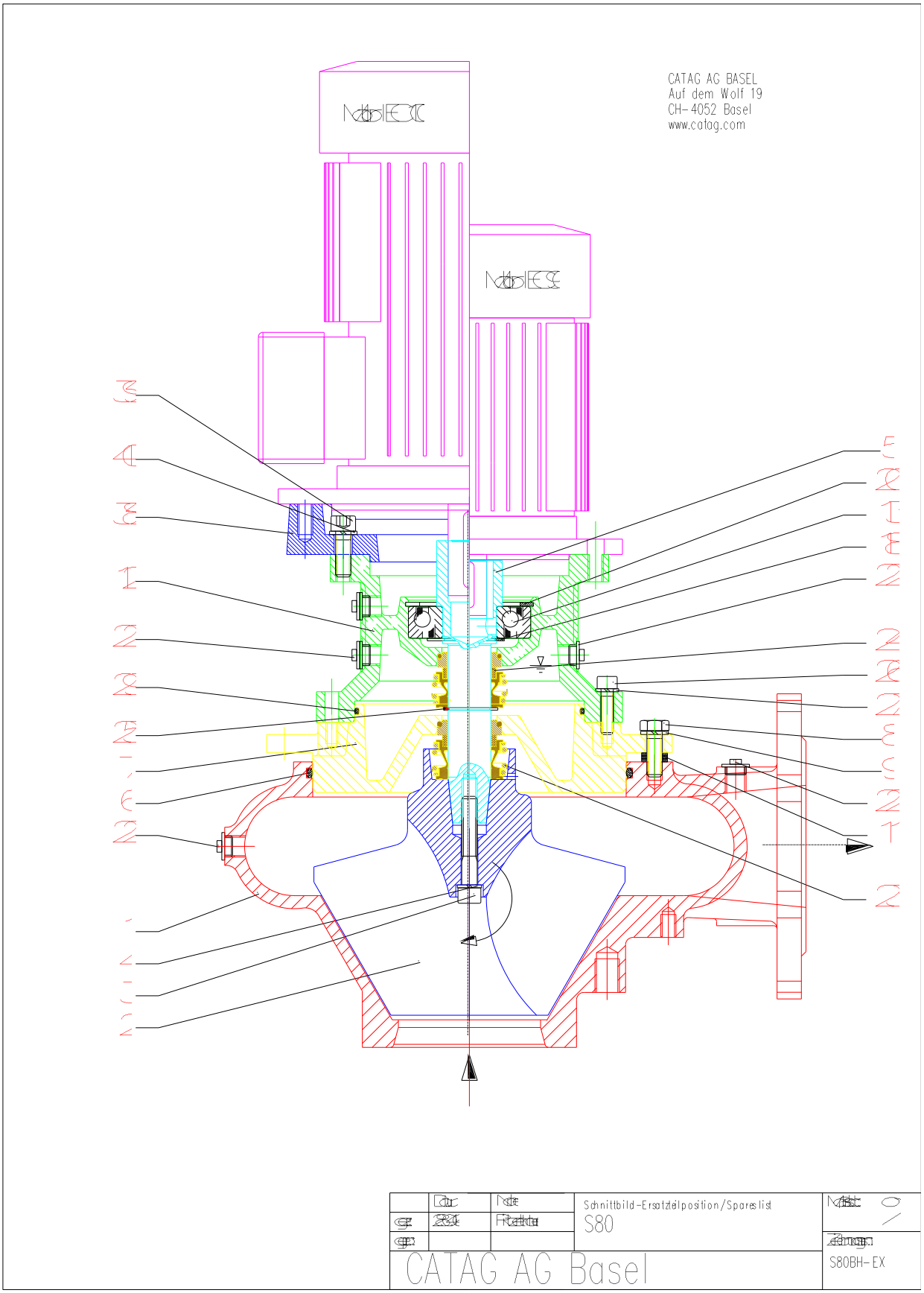
Rohrleitungsanschlüsse mit Kompensatoren
Pipe line connected by compensators
Tuyauterie à raccorder par compensateurs

Konstruktionsänderungen vorbehalten!
Alterations reserved!
Modifications réservées!

L kann wegen Einstellbarkeit des Laufrades bis zu ±4 mm variieren
L may vary up to ±4 mm because of adjustable impeller clearance
L peut varier jusqu'à ±4 mm à cause de roue réglable

TYPE	A	B	E	F	H	H1	H2	L	L1	Q	X	Y1	Y2	Zmch Motor ~ KW	KW	KW	KW
S 80.1–	80	80				113	150	94	65			113	113	240			
														1,5			
S 80–	100	80	350	300	240	160	220	135	n.K.	n.K.	0	170	145	240	280		
														1,5	3		
S 100–	100	100	400	300	290	188	250	173	190	14	0	202	170	300	320		
														4	5,5		
S 100.1–	150	100	500	400	330	240	300	253	230	14	0	230	230	440	440		
														11/15	15		
S 150–	200	150	750	500	400	325	450	340		18	0	320	253	640	640	680	
														22	30	37	
S 250–	300	250	750	500	400	370	440	360		18	100	415	325	640			
														30			
S 200–	250	200	750	750	500	355	500	384	400	20	0	420	323	800	840	900	
														55	75	90	
S 300–	300	300	1000	750	600	520	420	575	255	22	300	565	440	800	840	900	
														55	75	90	
S 125–	150	125	500	400	330	255	340	262	260	14	0	275	215	440			
														7,5			

18


CATAG AG BASEL
Auf dem Wolf 19
CH-4052 Basel
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Schnittbild-Ersatzteilposition/Spareslist
S80
CATAG AG Basel
S80BH-EX

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Pos Nr.	Teile Bezeichnung	Bestell-Nr.	Part name
1	Pumpengehäuse	51.11933	pump casing
2	Schraubenkanalrad	S 80-12	screw type impeller
3	Zylinderschraube	M 10x60	cylinder head screw
4	Federring	10 DIN 7980	spring ring
5	Welle	S 80-25	shaft
6	Runddichtung	5/205/215	o-ring
7	Dichtungsflansch	S 80-94	sealing flange
8	Sechskantschraube	M 10x30 DIN 933	hexagon bolt
9	Federring	10 DIN 127B	spring ring
10			
11	Distanzscheibe	11x2	spacer disc
12	Lagerflansch	S100-13	bearing flange
13	Rillenkugellager	6307 2RS	grooved ball bearing
14			
15			
16			
17			
18	Sicherungsring	A35 DIN 471	safety ring
19			
20	Sicherungsring	J80 DIN 472	safety ring
21			
22	Stopfen	GF 292 R 1/4"	plug
23	Wellendichtung Hartmetall	D=28	shaft sealing special
24	Wellendichtung Kohle/Chrom	D=28	shaft sealing
25	Sicherungsring	AV 28	safety ring
26	Sechskantschraube	M8x30 DIN 933	hexagon bolt
27	Federring	8 DIN 127B	spring ring
28			
29	Runddichtung	3.53/142.2	o-ring
30			
31			
32			
33			
34			
35			
36			
37			
38	Motorflansch 90/100	S 80-24	motor flange
39	Zylinderschraube	M10x30 DIN 912	cylinder head screw
40	Federring	10 DIN 7980	spring ring
90	Grundplatte BH	BG80-04	base plate BH

Bei Bestellung von Ersatzteilen bitte Bestellnummer, Typ, Pos, Nr., Masch.-Nr, und Auftrags-Nr.

In case of spare orders, please specify type, part number, quantity, serial no.

Maximale zulässige Temperatur der Förderflüssigkeit: 60°C
Maximum admissible temperature of pumped fluid: 60°C
Température max. admissible du liquide véhiculé: 60°C

D	Ölmenge: 0.7l Ölqualität: BP-Energol-WM 2 Weissöl, lebensmittelecht	Oil quantity: 0.7l Oil quality: BP-Energol-WM 2	quantité d'huile: 0.7l qualité d'huile: BP-Energol-WM 2